27^{th} TJIMO

Alexandria, Virginia

Round: **Orienteering**

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0. If $a \cdot b \cdot c \cdot d \cdot e = 1$, and a, b, c, d, and e are all positive real numbers, what is the minimum value of $a + b + c + d + e$?

1. There is a soaked watermelon weighing 10 kilograms and is found to be 99% water. It was left out to dry for a set time and it was found to be 95% water. What is the new weight of the watermelon in kilograms?

2. If you multiply all primes less than 100, what would the last digit be?

3. There are 4 mangoes, 3 apples and 2 oranges in a bag, fruits of the same variety being identical. In how many ways can a selection of fruits can be made if at least one of each kind is selected ?

4. Find smallest positive integer such that it is a multiple of 9 and it has no odd digits.

5. Thomas Jefferson rolls 2 standard 6-sided dice and writes down the sum of the top faces. How many different values could the sum have?

6. A square is inscribed in the circle. If the area of the square is 36 what is the area of the circle? Express your answer in terms of π.

7. At any given time, there are two angles formed by the hands of the clock. What is the larger angle, in degrees, formed by the two hands at 12:48?

8. Given $2^x + 2^{13} + 2^{10}$ is a perfect square. Determine the value of x.